

# Comprehensive Inspections Program:

QA/QC and Weekly Inspections  
Program Recommendations  
August 25, 2006



## 1.0 RECOMMENDATIONS SUMMARY

The RBF Team has developed the following set of recommendations for the QA/QC and weekly inspections programs.

1. TDOT should implement a self-monitoring program that incorporates site inspections, inspection oversight, and program reporting and documentation. It is proposed that TDEC serve a regulatory oversight role in this program, reviewing TDOT implementation of the program as appropriate.
2. TDOT should develop and implement an internal comprehensive inspection program (self-monitoring program) that includes Construction General Permit (CGP) inspections and project quality assurance (QA) site assessments. The TDOT comprehensive program should include the following components:
  - a. Construction site inspections using trained TDOT site personnel and an inspection schedule consistent with the CGP. Inspection records should be maintained on site with the SWPPP, and copies submitted to TDOT regional offices and Environmental Division.
  - b. Quality assurance site assessments performed by newly created Storm Water Coordinator positions within the TDOT Environmental Division (supplemented by consultants as necessary), with the ability to stop work on the project for CGP violations. The QA site assessment frequency should be based on criteria developed by TDOT. Consultants should be used for QAs on sites with lower inspection frequency as needed. QA records should be maintained in the regions and at the Environmental Division.
  - c. Items identified during inspections as major maintenance items should be completed within 24 hours from being identified. Minor items should be completed in a timeframe consistent with the CGP.
3. TDOT should discontinue sending QA reports to TDEC on every site. Instead, TDOT should investigate developing a tracking program that can be accessed by TDEC and will contain the same level of information currently available to TDEC. Also, TDOT should develop an annual report on the self-monitoring program to submit to TDEC. This report will indicate the number of site inspections and QA site assessments performed and provide an overview of the types of deficiencies noted during the reporting period. In its oversight role, TDEC may review site inspection reports from the construction site inspections or the QA site assessments at any time.
4. TDOT should inspect sites covered by CGPs based upon the inspection frequency established in the CGP or other construction permit developed at a later date.
5. TDOT should develop and implement an ongoing training program for site inspectors and general contractors. The training should be provided by the Storm Water Coordinators, and TDEC personnel will be invited to attend. After the initial training, annual training will be conducted at the regional level to ensure coverage of contemporary practices, changes to any related regulations, and changes to EPSC-related specifications.
6. TDOT should **not** rely on contractors for site inspections. However, general contractors should be required to attend inspector training, to perform their own site inspections, and to attend inspections performed by TDOT personnel.

The following sections provide information and rationale in support of the recommendations noted above.

## **2.0 THE EXISTING QA/QC PROGRAM**

The RBF Team has reviewed the approach proposed by TDEC and TDOT to replace the existing QA/QC Site Assessment Program required by the Consent Order. This document describes our findings on the existing program's accomplishments and shortfalls, a findings summary for other DOTs, and our roadmap for developing an effective long-term program for construction site environmental compliance.

It is generally agreed within TDOT and TDEC that the existing QA/QC program can be improved. Volumes of reports are developed monthly that TDEC and TDOT staff cannot review due to staffing levels. Non-conformances are cited that cannot be reacted to in a timely manner. Changes are not occurring at the site level to prevent problems; instead, changes are being made after a problem has occurred and been identified by the QA/QC team. Furthermore, the QA/QC site assessment has become more like an inspection than an actual QA/QC site assessment, because the ability to affect site changes has shifted away from the weekly site inspector and more towards the QA/QC site assessment team.

However, TDOT and QA/QC consultant teams have noted positive changes. TDOT site personnel and contractors are being trained by the QA/QC assessment teams and the Regional Environmental Coordinators on permit compliance issues and EPSC. Site personnel awareness and knowledge of EPSC measures has greatly increased.

An analysis of the existing QA/QC program (data through January 2006) provides the following information:

- As of January 2006, there were 124 active projects requiring QA/QC site assessments. Of these, 19 were bi-monthly assessments, and the rest were monthly. These sites were spread fairly evenly throughout the state.
- In the near future, it appears that the number of projects requiring QA/QC site assessments will remain fairly constant, most likely fluctuating between 120 and 150.

### **2.1 The Proposed Joint Departmental Compliance Oversight Unit Approach**

The proposed joint Departmental compliance oversight unit was developed in an effort to overcome some of the gaps in the existing QA/QC Assessment program. Specifically, it is TDEC's desire to make the program more effective and efficient by adding TDEC employees that will interact with TDOT employees at a regional level, consistent with TDOT's 4 regions. It is the desire of TDEC to make the stream mitigation response after a release of sediment from a Department construction site more efficient by allowing the TDEC Field Offices (FOs) to issue stream mitigation general permits when supported by the Compliance Oversight Unit.

After reviewing the proposed Compliance Oversight Unit approach, our comments are as follows:

1. The Compliance Oversight Unit approach appears more focused on handling problems at construction sites after they have been identified rather than preventing the problems before they occur. Emphasis must be placed on prevention.

2. Several systematic problems are not addressed by this approach:
  - a. The authority to gain compliance immediately at the site level has not been addressed.
  - b. Contractor disincentives and incentives for compliance with the Construction General Permit have not been addressed.
3. Decentralization of some permitting responsibilities to the FO will be more efficient.
4. Joint training between Departments will be effective. TDEC and TDOT staff will be more likely to be “on the same page” during inspections after joint training, and the unique issues related to linear construction will likely be discussed between staffs during training. Ultimately, both staffs will have a better understanding of EPSC on TDOT sites.

Due to the issues noted above, implementation of the Oversight Unit Approach is not recommended.

### **3.0 CURRENT WEEKLY INSPECTIONS PROGRAM**

Currently, TDOT is performing weekly inspections based upon two regulatory documents: the Consent Order signed in 2004 and the General NPDES Permit for Storm Water Discharges Associated with Construction Activities (TN CGP) issued in 2005. The inspection frequencies required by each document are not in agreement.

#### ***Consent Order***

The Consent Order requires the following:

*Inspections of EPSC measures shall ... be performed before anticipated rainfall events and during or within twenty four hours after any rainfall event that exceeds 0.5 inches.*

And

*TDOT and/or its contractor(s) shall conduct inspections of EPSC measures and potentially impacted streams, at least once per week during any construction, and thereafter until the site is permanently stabilized.*

#### ***General Construction Permit***

The language in the Consent Order was consistent with the TN CGP that expired in 2005. A new TN CGP became effective in June 2005 that states the following related to construction site inspections:

*Inspections... shall be performed at least twice every calendar week. Inspections shall be performed at least 72 hours apart.*

After seeking guidance from TDEC, it was determined that the inspection requirements in each regulatory document were not mutually exclusive and that both inspection criteria had to be met. TDOT inspection practices were then modified to include both inspection schedules.

### **3.1 Other Related Regulatory Drivers**

Besides the TN CGP and Consent Order, other regulatory documents related to construction site runoff control have recently been approved or are in draft form.

#### ***Draft Linear Construction Permit***

TDEC is currently working on a draft construction general permit specifically for linear construction projects through a TN CGP Task Force. This draft permit requires that routine

inspections of linear construction projects be performed once every 14 days. TDOT roadway construction activities are considered linear construction projects.

### **TMDLs**

Furthermore, in recently approved sediment TMDLs (Ft. Loudon Lake Watershed Sediment TMDL and Hiwassee River Watershed Sediment TMDL approved in January 2006), the implementation strategy for implementing waste load allocations for construction sites relies on “strict compliance with the provisions of the General NPDES Permit for Storm Water Discharges Associated with Construction Activities” because the General Permit “can reasonably be expected to achieve reduced sediment loads to streams.”

## **4.0 SUMMARY OF OTHER DOTs**

The RBF Team has researched how other DOTs are complying with construction NPDES requirements. A summary of our findings of other DOTs can be found in Appendix A. A more general summary is provided below.

- In our research, no other DOTs were found to have a third party inspection or site assessment process. Most DOTs have created internal programs and processes to handle construction site storm water compliance inspections, with periodic regulatory oversight by their respective state regulators. NCDOT, for example, has instituted an internal site auditing process in addition to routine site inspections.
- Most state regulatory agencies perform audits of DOT programs. Audits are generally conducted as frequently as annually or as infrequently as every three years. The purpose of the audit is to ensure that the DOT is complying with regulations. In Delaware, the Department of Natural Resources and Environmental Control audits DelDOT once every three years.
- Many DOTs provide internal training and/or certification for site inspectors and engineers. In these states, bids on projects are not accepted unless the training/certification requirements have been met. For example, in January 2006, NCDOT began requiring contractors for new projects to maintain a certified site inspector for each project.

## **5.0 RECOMMENDED LONG-TERM SELF-MONITORING PROGRAM APPROACH**

As noted in the previous section, most DOTs have self-monitoring programs with oversight by the state regulator. Many DOT programs include some or all of the following components that increase their effectiveness at maintaining compliance and protecting natural resources:

1. DOT staff dedicated to performing inspections and permit compliance assessments.
2. Training for DOT and contractor staff on EPSC.
3. Coordination between DOT and state regulator field staff, including joint training on EPSC.
4. Authority to take action against contractors for EPSC or other permit problems in the field.

Therefore, our recommendation on a long-term approach for TDOT is to develop a self-monitoring program similar to the programs implemented by Caltrans and NCDOT, with routine program calibration and training coordinated with TDEC. Inspector training for TDOT and TDEC field staff should be developed and implemented to get both staffs on the “same page”. This should be followed by training for Contractor staff.

The steps necessary to go from the existing QA/QC and weekly inspections program to a comprehensive self-monitoring program are outlined below. Several of these steps can happen concurrently but should generally be implemented in order, as they build on each other. Figure 1 is a graphic representation of the steps needed to implement the Self Monitoring Program.

**Step 1.** Upper level management buy-in is required. This buy-in should be initiated by the Commissioner and translated into a Department-wide initiative woven into Department, division, region, and district mission statements and otherwise publicized throughout the Department. The direction and expected outcome should clearly be stated.

**Step 2.** Develop an inspector training program to implement at the Region or District level. The training should ultimately be delivered by the regionally located Storm Water Coordinator (see Step 3) and cover the following topics:

- Environmental permit basics – When is a permit necessary?
- EPSC and CGP requirements:
  - Proper BMP installation
  - Proper BMP maintenance
  - Limitations (so SWPPP can be modified if necessary)
  - Record keeping
- Performing inspections
- Role of TDEC and TDOT inspectors
- Role of Contractors

**Step 3.** *Site Inspectors.* Establish positions in Construction Offices within the Regional Construction Office to perform site inspections on projects covered by the TN Construction General Permit. Inspection frequencies should be performed at the frequency dictated by the TN CGP or any future construction general permit that applies to TDOT. Currently, the 2005 TN CGP requires inspections to be conducted twice weekly at least 72 hours apart. Job responsibilities include:

- Attend TDOT-specific training with Storm Water Coordinators (see below).
- Perform inspections in accordance with the TN CGP. Complete inspection documentation.
- Maintain rainfall gauges to verify rainfall amounts for structural practices.
- Update field SWPPPs as necessary.
- Participate in QA site assessments performed by Storm Water Coordinator or consultant.
- Oversee implementation of environmental permits related to storm water and stream protection required for each site, such as the TN CGP, ARAP, 401 Certification, etc.

Maintenance activities identified during inspections should be categorized as major or minor. Major maintenance items should include repairs or maintenance to be performed on measures located at or adjacent to streams where there is a potential for discharge into the stream. Minor maintenance items include those measures located interior to the project that do not directly discharge into streams and the failure of which would likely not cause off-site sedimentation into a stream. Major maintenance items should be completed within 24 hours after the need has been identified, and minor

maintenance items should be completed before the next rain event but in no case more than 7 days after the need has been identified.

*Storm Water Coordinators.* Add 8 additional positions to the TDOT Environmental Division to perform Quality Control project assessments, located in either District or Regional offices as noted in Table 1 and Figure 2. These positions should be similar to the existing Environmental Coordinators but have the title of Storm Water Coordinator to distinguish between roles (see Figure 3 New TDOT Staff Structure per Region). Initially, these positions should be CPESCs (or an equivalent level of experience) and TDEC Level I trained. Ultimately, these positions will be required to attend and then conduct the training developed by TDOT. Job responsibilities:

- Perform QA project assessments on high frequency QA sites (see Step 4).
- Have authority to stop work on projects for EPSC violations, such as the potential for a sediment discharge, an actual discharge, or failure to address onsite erosion.
- Develop and deliver EPSC training.
- Conduct routine training for TDOT EPSC site inspectors (weekly inspectors), contractor staff, and TDEC field staff.
- Review QA reports developed for projects with a low frequency QA and re-evaluate QA frequencies for projects.
- Identify projects that need to have QA assessments increased or decreased.
- Coordinate and conduct calibration training with TDEC.

Note: Existing QA/QC program consultants should be used to shift projects from the current structure to the proposed self-monitoring plan. The existing consultant base should also be used to conduct QA site assessments on sites with a low frequency QA need.

#### **Step 4.**

Each project should be evaluated to determine QA site assessment frequency based upon set criteria, such as the contractor's compliance history using rating tools such as the Clean Construction Initiative, discharge into impaired or high quality streams, or project size/difficult terrain. On low frequency QA projects, the existing structure of QA consultants or TDOT staff (as available) would provide QA project assessment at a less frequent interval, such as quarterly. On projects needing a more frequent QA assessment, QA site assessments would be conducted by TDOT staff on a monthly basis with the weekly inspector. The project list in each region should be evaluated monthly to determine the need to increase or decrease the QA frequency. When evaluating each project, requests from TDEC or TDOT to increase the QA assessment frequency should be considered.

As an example, screening criteria were established and included project size, location with respect to sediment impaired streams (303(d) listed streams) and location to high quality waters. This screening criterion was then applied to January 2006 project data. Table 2 summarizes the breakdown for high frequency QA site assessment projects by region.

Table 2. Example Screening Criteria for High Frequency QA Assessment Sites

	<b>303(d) stream</b>	<b>HQW</b>	<b>Disturbed area &gt; 100 acres</b>	<b>Total projects</b>
<b>REGION I</b>	2	7	4	13
<b>REGION II</b>	6	4	4	14
<b>REGION III</b>	10	1	6	17
<b>REGION IV</b>	9	1	1	11
<b>Total</b>	27 (49%)	13 (24%)	15 (27%)	55

*Note that the example criteria were based upon the available data. TDOT should refine the initial set of criteria for high frequency QA sites to include the criteria outlined in Step 4 above. The criteria should be adjusted as better data is collected and analyzed during implementation. The project status (high or low frequency QA) of all active projects should be reviewed and updated quarterly.*

**Step 5.** Develop a tracking mechanism to compile, analyze and report insufficiencies documented by weekly inspectors and QA teams. This tracking will:

- provide information for the Clean Construction Initiative ranking,
- provide data to support changing the frequency of QA assessments for projects,
- provide data to TDEC for review,
- provide an annual summary to TDEC to document improvements in EPSC practices (such as fewer insufficiencies over time),
- highlight needs for additional training,
- identify types of projects that have the least successful EPSC implementation so inspections can be refocused as necessary, and
- Identify changes in QA assessment frequencies for projects

**Step 6.** Modify contract language for contractors that specifically includes disincentives for EPSC violations. Include language to require contractors to attend the inspector training and to attend site inspections with TDOT personnel.

Figure 1. Steps Toward Self Monitoring

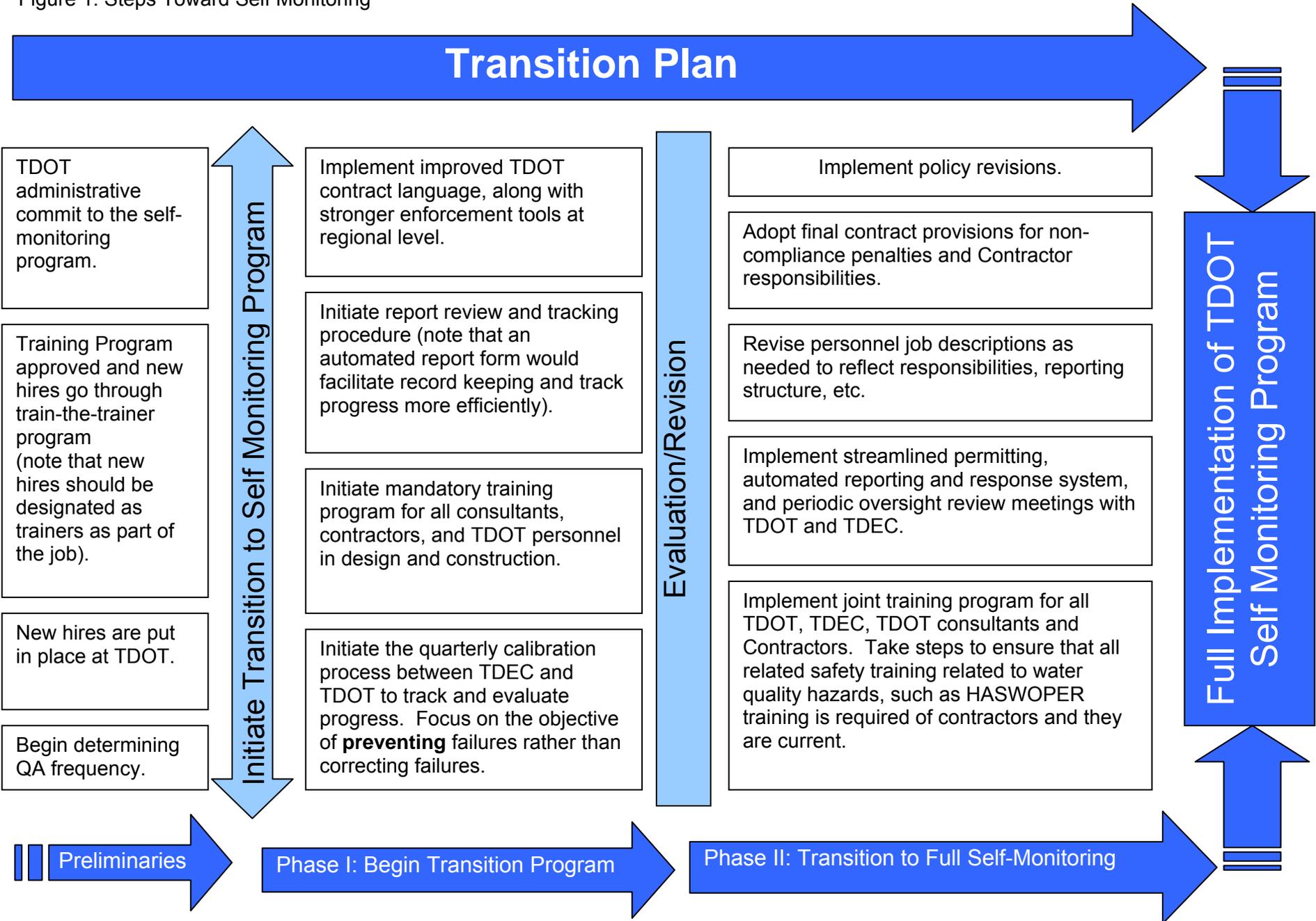


Figure 2. TDOT Office Locations for Storm Water Coordinators

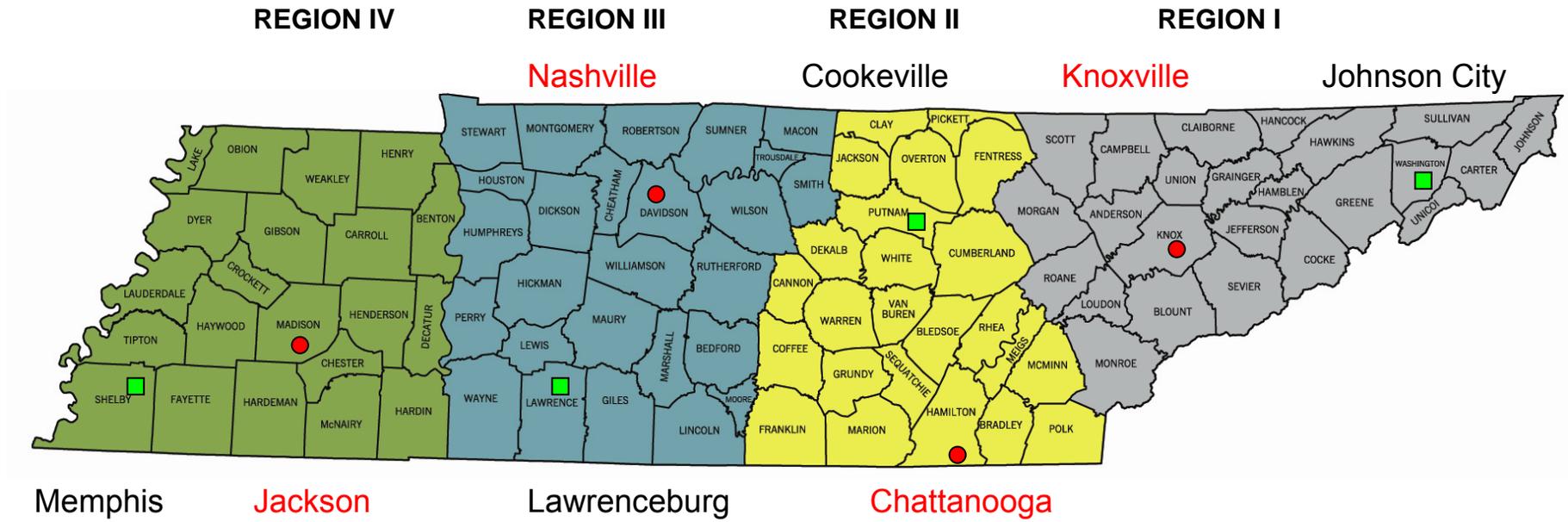
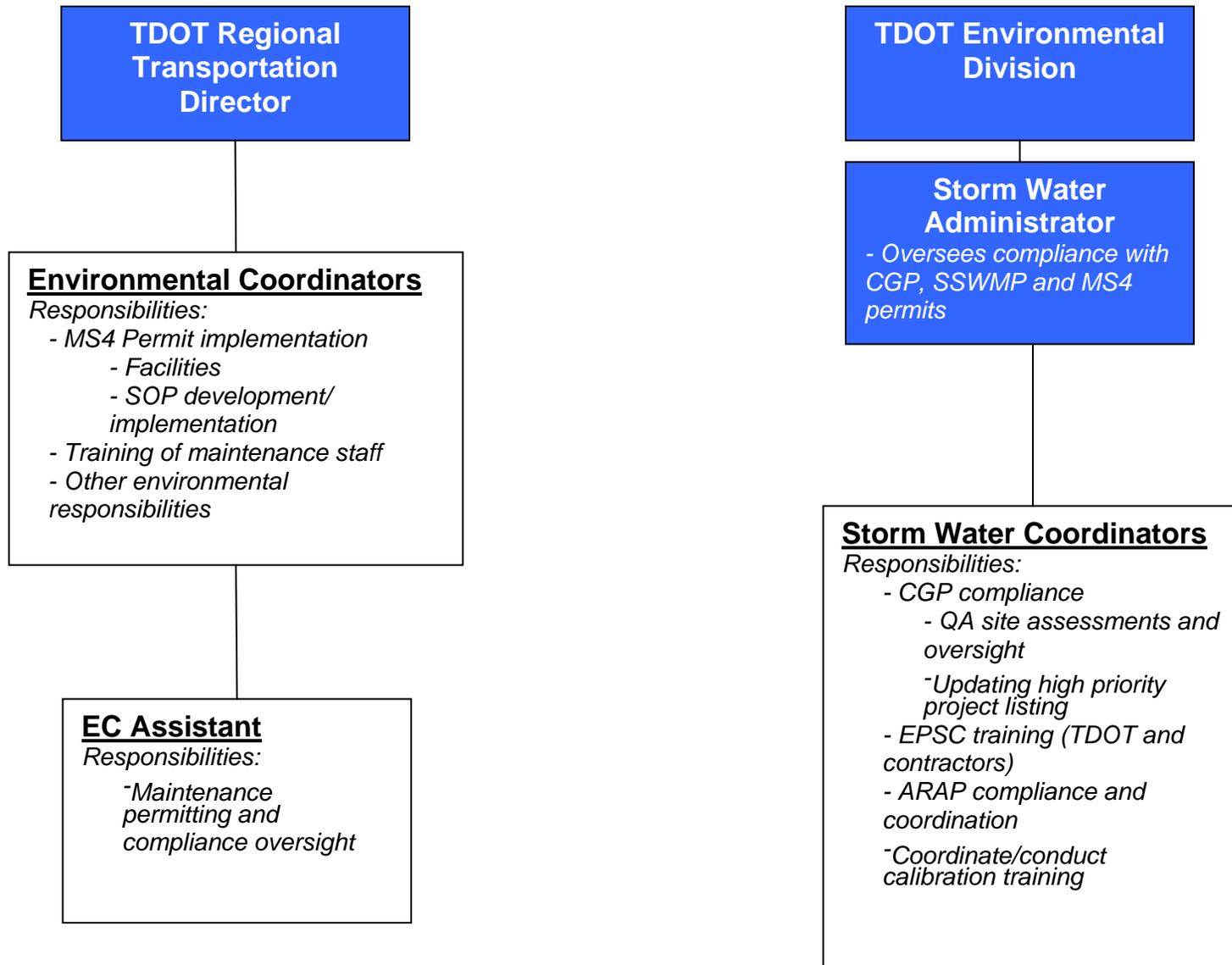


Figure 3. New TDOT Staff Structure per Region



## Appendix A

### SUMMARY OF THE STATE OF PRACTICE IN DOT CONSTRUCTION STORM WATER COMPLIANCE PROGRAMS IN THE US

#### ALABAMA DOT (ALDOT)

- Weekly Erosion Prevention and Sediment Control (EPSC) inspections are performed by a “Qualified Credentialed Inspector” (someone who has taken the “Qualified Credentialed Inspector” Program) that works directly for the contractor or developer.
- Every 6 months, compliance inspections are made by a “Qualified Credentialed Professional” (someone with a PE, PG, or CPESC) that is an outside consultant.
- Alabama Department of Conservation and Natural Resources may make unannounced visits and/or respond to complaints.

#### STATE OF CALIFORNIA (CALTRANS)

- For compliance monitoring, in each region, approximately 10 to 20 projects are selected and an outside consultant is used to assess the site on a monthly basis. The Consultant gives the site a 0 to 4 rating, with 4 being the worst.
- In many cases, the California State Water Resources Control Board (their version of TDEC) is involved in the monthly inspections and, especially, if the site inspected has previously received a low score.
- The consultants that are hired for the monthly assessments are interviewed by CalTrans and are pre-approved. Firms that have personnel with PE's and CPESC's are generally the ones that are hired.
- During the “non-rainy season”, bi-weekly (once every two weeks) EPSC inspections are required by the Contractor. During the “rainy season,” weekly EPSC inspections are required.
- The Contractor is required to include in the SWPPP his/her plan for EPSC inspections and they must have someone who is properly trained (24-hour training certified by CalTrans). They may also hire a consultant to do their weekly EPSC inspections.

#### DELAWARE DOT (DELDOT)

- Department of Natural Resources and Environmental Control (the state environmental regulatory authority) audits DeIDOT every 3 years to make sure they are in compliance and makes any recommendations.
- The state of Delaware has its own erosion and sediment control certification called “Certified Construction Reviewer” (CCR). Some high-priority/sensitive projects require a CCR to be on-site, as decided by DeIDOT. DeIDOT is seeking to move in the direction of having all weekly inspection reports done by CCR's.
- If a public complaint is received, DeIDOT sends someone out to evaluate the site.

#### GEORGIA DOT (GDOT)

- GDOT has set up an internal department called “Environmental Compliance.” This department has less than 10 employees and visits most DOT sites once every 2 weeks to ensure they are in compliance with NPDES permits, ARAPS, etc. and also that all BMP's are properly installed in accordance with E&S plans. They also check all paperwork such as weekly inspections and rainfall data.
- If the Georgia Environmental Protection Division (GEPD) receives a public complaint, they will generally call the GDOT Environmental Compliance department and allow them to go out first. However, GEPD may visit higher profile projects themselves.

- If the GEPD finds a site to be out of compliance, they will give GDOT a period of time to correct the problem and will re-schedule another visit to see the corrections.
- Contractors are responsible for weekly inspections and may hire an outside consultant if they wish.

### NORTH CAROLINA DOT (NCDOT)

- Currently have NCDOT site inspectors performing weekly inspections. Projects let after January 2006 are required to have a certified site inspector on the project, and the contractor is required to provide that individual. The certified inspectors are required to perform the weekly inspections. Certification program has been developed by NCDOT.
- Seven Field Operations Engineers (Roadside Environmental Section) perform monthly inspections of every site in their region, with one FOE per two districts. Most of these individuals are CPESC certified and PEs. They can recommend that work on a project be suspended because of an ICA (immediate corrective action) citation, and the Resident Engineer actually has the authority to suspend work. 99% of the requests to suspend work on a project are approved by RE.
- ICAs can be issued for non-compliances such as potential for off-site sedimentation, an actual sediment release, failure to provide groundcover or severe erosion onsite.
- Training – Roadside Environmental goes to every regional office on a 3 year rotation to perform training for bridge maintenance, construction and other personnel. Onsite construction personnel are required to take annual training.
- NCDOT coordinates with state regulator frequently. They conduct a quarterly calibration meeting with the Land Quality Section of DENR (the group responsible for overseeing the EPSC program in NC), where they go to construction sites and inspect it together. They feel that this onsite calibration helps to keep the NCDOT inspection staff on the same page as the Land Quality Section inspection staff.
- Prior to beginning a new project, they stake permit boundaries out in the field with orange safety fencing and conduct an Environmental Preconstruction meeting. During this meeting, they go over all permits and restrictions so everyone understands the permit requirements.
- Maintenance timeframes: Inspectors working under the Resident make a weekly punchlist or after each rain event. They place an abatement date on the report. Major maintenance items must be completed or repaired within 24 hrs and minor items in 3-5 days. Seeding and mulching must be completed within 21 days.

### VERMONT (VTRANS)

- In addition to weekly EPSC inspections, a PE or CPESC must visit sites with streams impaired by pollutants every 14 days.
- Other high-profile or sensitive projects may require an outside consultant or PE/CPESC to perform inspections or be on-site as decided by VTrans.
- Vermont Department of Natural Resources (DNR) may make unannounced visits and/or respond to complaints.

### MINNESOTA

- Maintenance timeframes: From the MN General Permit for Construction Stormwater:

All **erosion prevention** and **sediment control BMPs** must be inspected to ensure integrity and effectiveness. All nonfunctional **BMPs** must be repaired, replaced, or supplemented with functional **BMPs**. The **Permittee(s)** must investigate and comply with the following inspection and maintenance requirements:

- a. All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/3 of the height of the fence. These repairs must be made within 24 hours of discovery, or as soon as field conditions allow access.
- b. Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches 1/2 the storage volume. Drainage and removal must be completed within 72 hours of discovery, or as soon as field conditions allow access (see Part IV.D.).

- c. **Surface waters**, including drainage ditches and conveyance systems, must be inspected for evidence of sediment being deposited by erosion. The **Permittee(s)** must remove all deltas and sediment deposited in **surface waters**, including drainage ways, catch basins, and other drainage systems, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization must take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access constraints. The **Permittee** shall use all reasonable efforts to obtain access. If precluded, removal and stabilization must take place within seven (7) calendar days of obtaining access. The **Permittee** is responsible for contacting all local, regional, state and federal authorities and receiving any applicable permits, prior to conducting any work.
- d. Construction site vehicle exit locations must be inspected for evidence of off-site sediment tracking onto paved surfaces. Tracked sediment must be removed from all off-site paved surfaces, within 24 hours of discovery, or if applicable, within a shorter time to comply with Part IV.C.6.
- e. The **Permittee(s)** are responsible for the operation and maintenance of temporary and permanent water quality management **BMPs**, as well as all **erosion prevention** and **sediment control BMPs**, for the duration of the construction work at the site. The **Permittee(s)** are responsible until another **Permittee** has assumed control according to Part II.B.5 over all areas of the site that have not been finally **stabilized** or the site has undergone **final stabilization**, and a **NOT** has been submitted to the MPCA.
- f. If sediment escapes the construction site, off-site accumulations of sediment must be removed in a manner and at a frequency sufficient to minimize off-site impacts (e.g., fugitive sediment in streets could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

- From MNDOT training information:

Sediment removal must be scheduled for perimeter sediment control BMPs when accumulated material reaches 1/3 of the height, or replace with a functional BMP within 24 hours of discovery. For temporary basins, sediment must be removed when accumulated material reaches 1/2 the storage volume of a basin or 1/2 the height of the riser. Permit requires removal be completed within 72 hours of discovery or as soon as site conditions permit access.

Non-functional BMPs require repair or replacement within 24 hours of discovery.

#### VIRGINIA

- From the VA General Permit for Construction Stormwater and from VDOT training:

“The SWPPP must include a description and schedule of procedures to maintain in good and effective operating conditions vegetation, erosion and sediment control measures and other protective measures during construction identified in the site plan. If site inspections required by Section II D 4 identify BMPs that are not operating effectively, maintenance shall be performed before the next anticipated storm event, or as soon as practicable to maintain the continued effectiveness of stormwater controls.”